

Claims

- [c1] 1. A method for controlling hydrocarbon injection into an engine exhaust to reduce NOx, comprising:
injecting the hydrocarbon into the engine exhaust in accordance with detection of a light-off event .
- [c2] 2. A method for controlling hydrocarbon injection into an engine exhaust to reduce NOx in such exhaust, such engine exhaust with the NOx and the injected hydrocarbon being directed to a catalyst for reaction therein, comprising:
(a) detecting a temperature difference across the catalyst; and
(b) injecting the hydrocarbon into the engine exhaust in accordance with the temperature difference.
- [c3] 3. A method for controlling hydrocarbon injection into an engine exhaust to reduce NOx in such exhaust, such engine exhaust with the NOx and the injected hydrocarbon being directed to a catalyst for reaction therein, comprising:
(a) detecting an exothermic reaction across the catalyst; and
(b) injecting the hydrocarbon into the detected exothermic reaction.
- [c4] 4. A method for controlling hydrocarbon injection into an engine exhaust to reduce NOx in such exhaust, such engine exhaust with the NOx and the injected hydrocarbon being directed to a catalyst for reaction therein, comprising:
(a) detecting an exothermic reaction across the catalyst; and
(b) detecting a temperature of an output of the catalyst in response to the detected exothermic reaction; and
(c) injecting the hydrocarbon into the reaction in accordance with the detected temperature.
- [c5] 5. A method for controlling hydrocarbon injection into an engine exhaust to reduce NOx in such exhaust, such engine exhaust with the NOx and the injected hydrocarbon being directed to a catalyst for reaction therein, comprising:
(a) detecting a temperature difference across the catalyst;
(b) comparing the temperature difference with a predetermined temperature threshold;
(c) determining an exothermic condition temperature at an output of the catalyst when the temperature difference is determined to exceed the threshold;

- (d) comparing the determined exothermic condition temperature with an exothermic condition temperature expected from the catalyst at a time prior to the determined exothermic condition temperature; and
- (e) modifying the injected hydrocarbon in accordance with said comparison.

[c6]

6. A method for determining peak efficiency temperature of a catalyst in reducing NO_x wherein such NO_x is reduced by reacting such NO_x in the catalyst with a hydrocarbon, comprising:

- (a) detecting a temperature difference across the catalyst;
- (b) comparing the temperature difference with a predetermined temperature threshold;
- (c) determining an exothermic condition temperature at an output of the catalyst when the temperature difference is determined to exceed the threshold.

[c7]

7. A system for controlling hydrocarbon injection into an engine exhaust to reduce NO_x in such exhaust, such engine exhaust with the NO_x and the injected hydrocarbon being directed to a catalyst for reaction therein, comprising:

- (a) a catalyst for facilitating a reaction between the injected hydrocarbon and NO_x in the exhaust;
- (b) a hydrocarbon injector for injecting the hydrocarbon into the exhaust upstream of the catalyst;
- (c) a detecting system comprising:
 - a pair of detector each detecting a common parameter in the exhaust, one of such sensors being upstream of the catalyst and the other one of the sensors being downstream of the first sensor; and
 - a processor for controlling the hydrocarbon injector in response to the pair of sensors.

[c8]

8. The system recited in claim 12 wherein the common parameter is temperature and wherein the detectors are temperature detectors.

[c9]

9. A processor for controlling hydrocarbon injection into an engine exhaust to reduce NO_x in such exhaust, such engine exhaust with the NO_x and the injected hydrocarbon being directed to a catalyst to facilitate reaction between the injected hydrocarbon and the exhaust NO_x, such processor being programmed to:

- provide a control signal to a hydrocarbon injector to inject the hydrocarbon into the exhaust upstream in response to output signal from a pair of sensors, each of the pair of

sensors being adapted detecting a common parameter in the exhaust, one of such sensors being upstream of the catalyst and the other one of the sensors being downstream of the first sensor.

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